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Medical and Surgical JOURNAL

OFFICIAL ORGAN of THE MASSACHUSETTS MEDICAL SOCIETY and of THE NEW ENGLAND SURGICAL SOCIETY

$5 per Annum. 15c per copy
Vol. CLXXXIII, No. 17

THURSDAY, OCTOBER 21, 1920

Published weekly in Boston, at 126 Massachusetts Avenue

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PATHOLOGY.

Studies in Compensation Hypertrophy of the Thyroid Gland.

Loeb, L., and Hesselberg, C. (*The Jour. of Med. Research*, Jan., 1920.)

1. The homoiotoxin does not prevent the effect of the growth substances of the thyroid gland, but it diminishes it. In this respect the action of the homoiotoxin is similar to the one we observed in the case of the substance given off by the corpus luteum, which calls forth the development of deciduomata. Homoiotoxin does not prevent the formation of deciduomata, but it diminishes their frequency and size.

We may therefore conclude that homoiotoxins not only interfere with regenerative processes which take place in response to injury, but also with the chemical action of growth substances. The homoiotoxin exerts this effect on the thyroid gland mainly through the homoio-reaction as expressed in the activity of lymphocytes, fibroblasts and vessels. There is at present no indication that the homoiotoxin has a directly injurious effect on those processes which lead to hypertrophy. However, the main effect of of the homoiotoxin consists in the calling forth of a secondary destruction of the thyroid tissue which had become hypertrophic. This destruction takes place principally by means of the lymphocytic reaction and less through the action of fibroblasts.

2. The hypertrophic changes in the thyroid do not in any essential manner alter the individuality-specific homoio-differentials. The homoio-reaction is as marked in the hypertrophic as in the normal gland.

3. The homoio-differential depends upon the relationship of the host and donor. In cases in which the homoio-reaction was very weak we could make it probable that we had to deal with a syngenesio-differential instead of a homoio-differential.

4. A considerable loss of weight which in one case amounted to as much as nineteen per cent. of the total weight of the animal and to a loss of eleven per cent. in the unit time does not need to prevent hypertrophy of the thyroid gland. A loss of weight sufficiently great to call forth the production of hypotypical ovaries may permit the hypertrophic changes. On the other hand, our evidence makes it at least probable that a gain in weight is more favorable for the occurrence of hypertrophy than a loss.

5. After an injury of the thyroid gland, particles of blood pigment may appear in the acinus cells as well as in phagocytes which are found in the lumen of the acini. These granules seem to persist longer in the acinus cells than in the lumen of the acini; they are especially prone to appear in hypertrophic cells; they were never seen in normal glands. We conclude that in this case we have to deal with a phagocytic activity on the part of the thyroid cells. It is probable that all cells which are capable of amoeboid movements are likewise capable of phagocytic activity. [E. H. R.]

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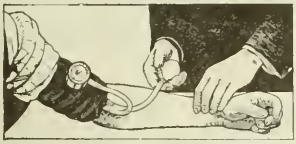

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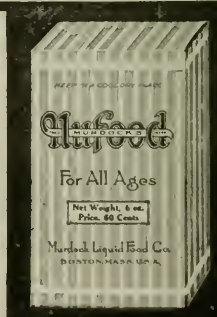

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Address.

SOME OBSERVATIONS ON THE TREND OF MODERN PEDIATRIC TEACHING.*

BY LEWIS WEBB HILL, M.D., BOSTON.

THE teaching of pediatrics in the last ten years has assumed more and more importance; the medical schools as well as the general public are beginning to realize that disease in infancy and childhood may in many cases offer widely different problems from disease in adult life. Therefore in most of the medical schools the departments of pediatrics have grown rapidly, and owing to the realization of the public that the ills of children need special knowledge the number of men devoting themselves exclusively to pediatrics, or at least making it their chief interest, has increased enormously, and is still increasing. Pediatrics is in a very active period, more so, perhaps, than any other department of medicine. Medicine in general is likewise in the most remarkable period of its entire history; medical education is becoming each year more and more efficient, and it is undoubtedly true that more good doctors are being sent out each year from the medical schools and hospitals than ever before. The study of medicine is a peculiar sort of education; it is taught differently in many ways from other branches of knowledge—it is part science, part art, and is neither wholly the one nor the other. In its history it has exhibited many different tendencies and each era has had its own particular problems. I wish to discuss today what seem to me problems that lie before us at the present time as teachers of pediatrics.

THE RELATION OF THE LABORATORY TO PRACTICE.

The function of a medical school is first of all to produce practitioners of medicine to take care of sick people; secondly, to produce new knowledge to further the science of medicine. Today is a day of research; the spirit of investigation is present in our medical schools as never before. Particularly is this true of pediatrics, where there are so many interesting and important problems still to be solved. As regards diseases of children, most of our new knowledge is coming through chemistry, and many of the teachers of pediatrics in the schools are expert chemists. These are represented mostly by the younger men; the older pediatricians have not had the training, time or inclination to go deeply into laboratory work. I do not mean to decry the laboratory nor the knowledge which comes from it, it is our best and most scientific method of getting

* Presidential address before the Association of American Teachers of Diseases of Children, New Orleans, April 27, 1920.

at the minute processes of disease, but I honestly believe that there is at the present time a danger of neglecting the clinical, practical side of pediatrics in favor of the laboratory. This must not be; we must teach practice preeminently, but still we must found our practice in so far as possible upon sound scientific principles which come largely from the laboratory. When in one teacher laboratory knowledge is combined with extensive and sound clinical experience, when he has above all, that most priceless of possessions in medicine, common sense, that man is valuable indeed to a medical school, provided we have, of course, the teaching power. If a man is preëminently a laboratory man and has not had a wide and a rich clinical experience, he is not the best man, in my opinion, to be the head of a department. A man should not be considered an accomplished pediatrician and teacher simply because he may have carried out some complicated physiological or chemical investigation, when he may be only a mediocre or poor clinician. On the other hand an old and expert clinician who knows or cares nothing of modern laboratory investigation, and who has not kept abreast of the latest research is not the best type of teacher either. The two qualities, laboratory knowledge and wide clinical experience, are fortunately combined in many of the teachers of the present era. One of the most important questions before medical schools today is that of the full time professor. No man in these busy days can give his best efforts to teaching, when he is continually at the beck and call of a large and exacting practice; therefore the full or half-time professor is the best solution of the teaching problem—of that I am convinced—but he should have practiced his profession for some years before he is appointed professor—he should not come directly from the laboratory to the chair, and he should not only be permitted, but required to do a consultation practice while he is professor. This is the only way in which he can keep in touch with practical medicine. He can bring to his students a freshness of vision and a knowledge of disease as it actually exists in sick children in their homes, which the exclusive laboratory and hospital man can never do. There is a very great difference between private and hospital practice, we all know that, and there are many conditions and situations which arise in private practice that one never encounters in the hospital. The average medical student is altogether too prone to attach too much importance to laboratory tests, he gets into the general attitude that he cannot make a diagnosis of pneumonia or empyema without a white count, the diagnosis of syphilis without a Wassermann, or that of tuberculosis without a Von Pirquet test. We should strive to make our students have a sense of proportion, to make them see the broad aspects of their cases, and to make them realize that the vast majority of the laboratory tests should be used as confirmatory evidence to the other data on the case—they must not get into the habit of putting the cart before the horse, and trying to make their cases fit the laboratory tests instead of the other way round. The modern medical student is a great theorist, he can usually discuss electrocardiograms and renal function tests with great intelligence—but he is often sadly deficient in a sense of proportion and in many of the practical questions of medicine. A thousand small details of practice ought to be impressed upon medical students; they must be made to realize that in private practice common sense and the making of the patient comfortable are usually more important than white blood counts. These details of practice, this family doctor attitude, which is, I believe, so necessary, can be taught to students only by a man who has practiced, and who has practiced long enough to be a shrewd, wise clinician. There is no necessity of conflict between science and practice—the student should be taught to use the scientific method in his dealings with patients, he should be a scientific practitioner, but he must be a practical practitioner.

The laboratory has helped us; it is responsible for most of the great advances in medicine; without it, and without our scientific viewpoint we are nowhere; but we must have a care in this era of science that in our enthusiasm for the teaching of the theory of medicine we do not neglect the teaching of its practice.

THE DIDACTIC LECTURE.

Fifty years ago a large part of medical instruction was given by means of didactic lectures, and the student had comparatively little chance to examine a patient once, much less to follow cases in the wards from day to day.

It was the late Sir William Osler who first insisted upon the necessity of thorough ward work in internal medicine; that the student should be allowed to take an active part in the conduct of the case. In pediatric teaching, likewise, we all recognize the great value of ward and out-patient work, and a large part of the instruction in the good schools is given in this way. The importance of this cannot be over-estimated; the student gets a chance to see patients with his own eyes instead of through the eyes of the lecturer; he regards the patient as his very own, and undoubtedly takes more interest in the disease than he would otherwise. I wish to lay especial stress on the fact, however, that the didactic lecture is still valuable, and that at the present time there is a considerable tendency to underestimate its value. The worth of the didactic lecture depends entirely upon the personality of the man who gives it: it can be flat and uninspiring, or intensely interesting. The man who takes up the various conditions discussed in a formal textbook style will rarely be successful, and such lectures are deservedly condemned. Lectures should be given in a more informal way; the lecturer should omit such material that can be obtained just as well by the student from his textbooks; he should take up in detail many small points not ordinarily discussed in the books; he should also take care to present in a live way the principles of whatever subject he is discussing, and especially should he illustrate his principles from his own personal experiences. Lectures which come from the rich experience of a wise man are always intensely interesting to the student and are never forgotten.

Dr. W. S. Thayer of Baltimore, in speaking of the lectures of Dr. Reginald Fitz, says, "No one who heard those remarkable lectures could have failed to carry away a deep impression of the strength, the ability, the learning of the man. They were remarkable lectures, remarkable in form and substance; models of clear and precise exposition, admirably delivered in language, every facetted word of which seemed to have been chosen so that it, and it alone, could fill its place. Stimulating hours which gave to many of us a lasting realization of the importance of precision and accuracy, in observation and thought and expression."

It is true that the didactic lecture has been overdone in the past, but let us not forget that good didactic lectures still have a great deal of value.

THE NECESSITY OF TEACHING FUNDAMENTALS IN INFANT FEEDING.

All of us would probably agree that infant feeding is the most important part of pediatrics. It is this that the young practitioner will have to do as soon as he starts practice; it is this which gives the young individual a proper start in life; it is this which is of supreme importance in reducing infant mortality,—one of the ultimate aims of every pediatrician and general practitioner. The necessity of devoting considerable time to infant feeding in the curriculum is self-evident; if possible it should be given both during the third and fourth years. To my mind the importance of a thorough course in infant feeding cannot be over-emphasized. In the third year the student should get didactic lectures, in the fourth year more lectures and demonstrations to small sections, combined with ward and out-patient work. Infant feeding should be hammered into him so that he feels he knows it better than any other subject in pediatrics. If the student does not have a thorough knowledge of the fundamentals of infant feeding when he graduates he will be lost. This necessity of teaching fundamentals I wish to insist upon, for it is this that is most often neglected. We must teach the chemistry of the baby and of his food, we must teach the student why he does this and that, we must let him see the reasons for his procedures. If he knows the groundwork, if he knows the principles upon which modern infant feeding is based, he should have little difficulty in applying these principles practically. Infant feeding must not be taught by rule of thumb or by memorizing various tables and formulae—it is not enough that the student knows how to make barley water and oat gruel, and about what to feed babies of various ages—he must know more about the baby himself; the physiology and chemistry of the baby's body must be the cornerstones upon which his whole structure of infant feeding is built. He must know intimately the various steps in the digestion and absorption of the food elements; he must know their relationships and influence upon one another, and the relationship of the intestinal bacteria

to them all. He must know the chemical processes that occur when fat or sugar or protein decomposes in the intestine: he must be taught the antagonism between putrefaction and fermentation: what determines the one and what the other; what processes tend to make an alkaline and what an acid intestine. In a word, he should be taught to know, in so far as any of us can know, the processes that are actually occurring inside of the baby that he is dealing with. If he has an understanding of these things he will feed his normal and abnormal babies intelligently instead of blindly. The standard of medicine in any community is no better or no worse than the standard of its general practitioners. General practitioners are the ones who do most of the infant feeding, particularly in the smaller cities and towns; the babies fed by the skilled pediatrician are comparatively few; it therefore rests with the general practitioner whether the majority of the babies in this country shall be fed well or poorly. Most of the graduates of our medical schools become general practitioners; therefore, let us concentrate on infant feeding in the curriculum, let us not be satisfied to give to the student a mere smattering of it, and above all, let us teach him the physiological and chemical processes upon which all nutritional therapy depends.

INFANT WELFARE.

Another subject to which especial attention should be given is that of infant welfare. In the last two years, as never before, has the importance of conserving child life been recognized, and there is going on all over the country an infant welfare movement of great importance. The medical student, however, usually hears very little of these things. There should be given in every medical school in the pediatric course, lectures dealing with the methods that are being used to promote infant welfare, and to reduce infant mortality. Particularly should the student be enabled to see something of the workings of milk stations. The medical student graduating from a big medical school and going back to his small home town to practice is expected to be, and very often is, a leader in the community. He should be active in promoting infant welfare. Therefore, he should be taught in the curriculum something of the methods that are used.

THE GRADUATE STUDENT.

Since the war the question of the duty of the medical schools to medical graduates has become more important than ever before. Practitioners are realizing more and more that their days of study must not stop when they graduate from the medical school, but that they must be continually students throughout their professional careers, if they wish to keep abreast of the times and to do high grade work. The unprogressive, who is oblivious to all progress, cannot compete with his fellows in these days; he must find time somewhere for a reasonable amount of study. Post-graduate training in pediatrics is very desirable for many practitioners, they feel the need of it, and as Dr. John Morse said some years ago at a meeting of this association, the average graduate of even ten years ago is very much behind the times as regards modern advances in pediatrics, unless he has been actively connected with a children's hospital, or has made pediatrics his special study. The general practitioners see most of the patients—the standard of medical practice in a country should be judged, not by the attainments of the specialists, but by those of the general practitioners. The medical schools of this country owe a responsibility to these men: they must see that their needs are met; they must furnish adequate post-graduate training for them. Pediatrics is getting to be a very popular specialty, and every year there are many general practitioners who wish to spend a month or two in some large medical center brushing up their knowledge of diseases of children. Two of the best known post-graduate schools had 294 students taking courses in pediatrics during 1919. Furthermore, there are many men who have been in general practice for several years who wish to discontinue it and to devote themselves to pediatrics entirely. Such men as these make, as a rule, excellent specialists. They have a broad knowledge of disease in general, and a common-sense viewpoint which, combined with a year or two of special intensive training, is very likely to produce a first-class pediatrician. There is a splendid opportunity in many towns of from 25,000 to 100,000 inhabitants for such men as this, and I believe that there is no question but that in the next few years more and more general practitioners will be turning to pediatrics as a specialty.

The needs of these men must be met: the big medical schools of the country are not doing their duty if their needs are not met. Medical education should be a continuous affair, the student should not lose track of his medical school when he graduates, but should return to it for brief or for longer periods of study, as the case may be; and the school should welcome him with open arms. I believe that each year graduate instruction in medicine will grow in importance, and eventually that the more progressive medical schools will pay fully as much attention to post-graduate instruction as they do to undergraduate. Post-graduate work should be in the hands of the medical school. Unfortunately it has not been, except in a few instances, and therefore, many special post-graduate schools have sprung up, a few of which are excellent, but most of which are not at all first class. Some medical schools will recognize these responsibilities, some will not; but those who do will be the gainers, for nothing can give more prestige to a medical school than to have large numbers of graduate students from all over the country flocking to its door for instruction. Post-graduate teaching is difficult, there is no question of that, and when there is at the same time necessity for undergraduate teaching, the resources of the teaching staff of the school are taxed very heavily. In the smaller schools post-graduate work probably should be confined to the summer months, when the undergraduates are having their vacation.

As regards the big schools, I do not feel at all certain whether it is better to offer post-graduate instruction only in the summer months or to carry it on during the whole year. There are good arguments to be advanced in favor of both plans. All detail concerning post-graduate instruction must be run just as carefully, and it must be considered just as important as the undergraduate teaching. The graduate student has left his practice and his family; he is making a good many sacrifices in an honest effort to improve himself. We should all take a personal interest in these men, and try to make their stays with us as pleasant and as profitable as possible.

There are only a few medical centres in the United States of sufficient size to give elaborate post-graduate instruction in pediatrics, and I suppose that the bulk of the instruction will be given in these centres; but it is possible even in smaller places to have weekly ward rounds or clinical lectures, to which the local practitioner may come. There are many men who would not be able to give up a month or several months to spend in continuous study in one of the big centres, who would easily avail themselves of a weekly clinic at the local children's hospital. In addition to the longer courses, this method of teaching has been used for some years in Boston, and it has been exceedingly popular. Different schools will probably adopt different methods and will cater to the various needs of different classes of men; this is as it should be. We have in America enough large pediatric centres so that any post-graduate student should be able to secure any kind of instruction in pediatrics, whether it be laboratory or practical, without any difficulty whatsoever.

THE NECESSITY OF A GOOD GENERAL EDUCATION FOR STUDENTS.

A thorough general education is essential to a doctor. He should be a cultured man: he should be able to *see clearly*, which after all, is the final purpose of education. We teach in the medical schools many facts, but the student cannot use these facts correctly or see them in their proper relationships unless he has been taught previously how to think. The difference between the educated and the uneducated man is the difference between straight and distorted thinking.

The standards for admission to the medical schools even now are none too high: in the past they were deplorably low, and immature young doctors were being turned out wholesale, who did not have even the rudiments of a general education. The purpose of college training is to teach the student how to think originally, how to appreciate facts in their proper proportion, to distinguish the essential from the non-essential, to have a wide vision instead of a narrow one. History, philosophy, biology, the languages, mathematics, everything that bears upon human progress—all have their share in this. It was not fitting that young boys with sometimes less than a high school training should take up such an enormously complicated study as medicine, a study in which so much fine discrimination is needed. Credulity is a concomitant of a lack of educa-

tion, and it is due to the credulity of many of our poorly educated doctors that so much poor therapy is practised, that so many proprietary or semi-proprietary remedies are used, whose extravagant propaganda the credulous, non-thinking type of doctor accepts as gospel truth because he sees it on a printed page. Even with all our science in this modern era, we are not free from fads—there are epidemics of fadism as well as of disease, that sweep over our land, and there is need at present in medicine for much caution in accepting new therapeutic agents especially. The best guard against rashness in this respect is a high standard of education for doctors. Anyone who is continually seeing graduate students, many of whom graduated from poor schools where there were practically no standards for admission, is often struck by the surprising lack of thinking power that some of them show; they do not think logically, they have learned their medicine by rote rather than by acquiring a knowledge of principles and then applying specific facts in accordance with these principles; their formula is that for a certain disease a certain drug is given, they may or may not stop to think why, or just what they expect to accomplish by means of the drug; they practice superficially rather than by trying to dig under the outside crusts of their problems, by going back to principles rather than to rules: they lack a clear vision and a broad viewpoint. A partial remedy for all this is general education, and with it a development of the critical faculty. The vast majority of the medical students of today *are* unusually well educated, thanks to the reforms which have been going on in the last fifteen years, and I doubt if there is a more intelligent, better reasoning class of men anywhere than these same students of the better modern schools. They are being taught what medicine is; that it consists of more than giving a certain drug for a certain disease; by means of the basic medical sciences they are being taught the broad truths upon which medicine rests and the critical faculty, which does not allow them to believe all they see in print, which keeps them away from the irrational and the extreme; as educated men they can appreciate truth and detect error. In short, they are being taught, I hope, something of the philosophy of medicine.

In the words of William Osler, whom one may well call a great medical philosopher, and a tireless seeker after truth:

"The higher the standard of education in a profession, the less marked will be the charlatanism, whereas no greater incentive to its development can be found than by sending out from our colleges men who have not had mental training sufficient to enable them to judge between the excellent and the inferior, the sound and the unsound, the true and the half-true."

Original Articles.

ACUTE RESPIRATORY INFECTIONS AT THE BOSTON CITY HOSPITAL. FROM THE PNEUMONIA SERVICE.*

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ORGANIZATION.

DURING the influenza epidemic of the fall and winter of 1918-1919 the need was felt for more adequate facilities for the diagnosis and treatment of the pulmonary complications arising in the influenza cases. A special fund of $3,000 was made available for the expense of such a service by His Honor the Mayor, and the service was put in operation February 3, 1919. So far as organization and equipment are concerned, the service was made an independent unit of the hospital with its own bacteriological and clinical laboratories under the Pathological Department, portable x-ray apparatus, special record system, etc.

The advantages of a separate pneumonia service were early apparent. First, all such cases should be segregated to prevent, as far as possible, danger of infection to other patients in the hospital. Second, the special technical study of this class of patients can, as a routine, be carried out as is not possible when patients are scattered throughout the hospital on the four regular medical services. Third, particularly careful observation and nursing are necessary with this group of serious, acute dis-

* Report of the work of the special service given at the hospital clinical meeting, April 25, 1920.

cases which can be provided only when such patients are grouped in a few wards. Fourth, certain forms of treatment, such as the administration of serum, require expert training on the part of the resident physicians giving it. Fifth, the grouping of cases for study must inevitably stimulate those placed in charge of such a group to their best possible effort. Sixth, the assembling of all cases of a given disease in a few wards and on a single service is an immense advantage to all members of the medical staff in that it affords an opportunity for the observation of a relatively large number of cases under most favorable conditions. The same material is also more available for teaching.

It was frequently found impossible in the admitting office to certainly differentiate between the cases of influenza and other acute pulmonary infections, hence practically all cases of pneumonia admitted to the hospital were also sent to the influenza service. The success of the work with the pneumonia cases was so evident that in June, 1919, when the influenza epidemic had died out it was unanimously voted by the medical staff to recommend to the Board of Trustees that the service be continued permanently as a special pneumonia service. As now organized the work is in charge of one of the visiting physicians of the hospital who is chosen by the medical staff each year. One or more of the visiting physicians or first assistant visiting physicians may serve as associate or assistant once each year for a period of not more than three months. The house staff consists of a resident physician and from two to four of the senior medical internes of the hospital. It is provided that each senior medical interne in the hospital is assigned to the pneumonia service for a period of two months.

A very satisfactory cubicle system is maintained by the use of screens 5½ by 7 feet, made of unbleached cotton stretched over a light wooden frame. This frame is held in place by tape at the head of the bed, thus being easily swung away from the foot to facilitate examination or care of the patient. But one screen is necessary for each bed. The importance of this cubicle arrangement is twofold. First, it has apparently been effective in preventing cross-infections, and second, the critically ill are virtually isolated. This method of isolation has proved so satisfactory that it has only very rarely been necessary to transfer a patient to a single room.

The cases of pneumonia developing empyema or requiring any minor surgical treatment are treated by a surgical service but remain in the wards of the pneumonia service, the patient thus having the advantage of both surgical and medical supervision. By vote of the senior staff all patients entering the hospital with empyema are admitted to the pneumonia service.

From February 3, 1919, to April 30, 1920, a total of 1078 cases were admitted to the service. Of these, 85 were influenza, 188 influenza and pneumonia, 164 bronchopneumonia, 447 lobar pneumonia, 29 empyema (admitted as such), and 165 miscellaneous conditions.

INFLUENZA AND INFLUENZA-PNEUMONIA.

As the service was not organized until February 3, 1919, practically all of the cases of influenza were observed during two limited periods, namely, from February 3 to April 30, 1919, and January 16 to March 16, 1920. The former was following the period of the secondary wave of the great epidemic of 1918, and the second the recurrent epidemic of 1920. For this reason it is evident that the number of cases seen on the pneumonia service is too small to be of value in discussing the incidence and mortality from influenza. We have therefore combined our statistics with those of the other medical services. The two following charts are based on the figures for all cases of influenza entering the hospital during the epidemic periods, or a total of 1,744. They are designed to show by weeks the actual number of patients admitted, the percentage of complicating pneumonias and the mortality among the influenza-pneumonia cases.

Chart 1 covers the period from the beginning of the first epidemic, September 3, to the end of the minor epidemic of the following winter. The heavy solid line representing the number of patients admitted by weeks shows the characteristic abrupt rise to a maximum of 172 in the third week, a slightly less rapid fall during the next four or five weeks, then more slowly approaching zero, the main epidemic covering a period of six to eight weeks. This type of curve is commonly observed in epidemics of this disease.

After a period of approximately six weeks the curve is, to a considerable extent, duplicated. There is the same sharp rise during

CHART I.

ACTUAL NUMBER OF INFLUENZA CASES, PERCENTAGE OF PNEUMONIA AND DEATH-RATE AMONG PNEUMONIAS, SEPTEMBER 3, 1919, TO MARCH 17, 1920, ARRANGED BY WEEKS. 1430 CASES.

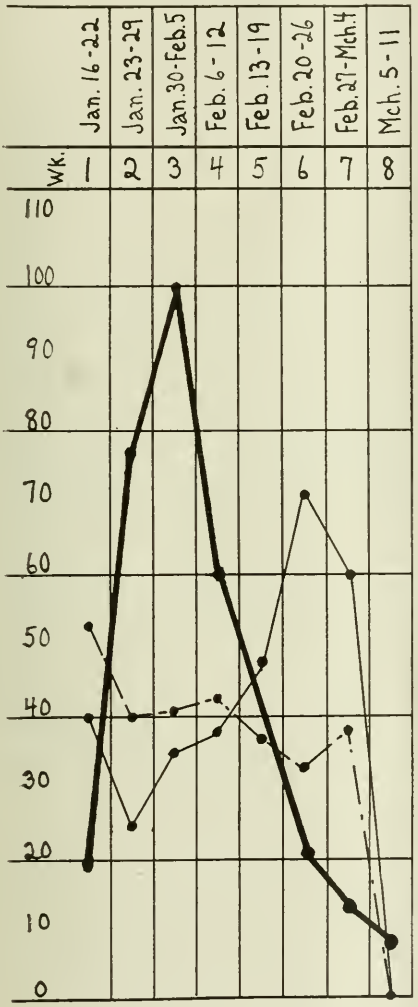
Black line=actual number of cases; Broken line=percentage of pneumonias; Light line=death-rate among pneumonias.

the first week, but it is to be noted that the maximum is reached more quickly and is only about one-third as great as the maximum in the main epidemic. The number of new cases does not diminish to any marked extent for the next month, and then descends much more slowly and irregularly.

The facts indicated by the remaining curves are clear, but their interpretation and significance very puzzling. It will be seen that the percentage of cases with pneumonia was at first low,—27 per cent.,—but rose rapidly until the ninth week, when it reached 77 per cent., this maximum occurring some weeks after the beginning of the subsidence of the epidemic. The decline was then rapid, but remained above 40 per cent., with the exception of a single week, when it fell to

CHART II.

ACTUAL NUMBER OF OF INFLUENZA CASES, PERCENTAGE OF PNEUMONIA AND DEATH-RATE AMONG PNEUMONIAS, JANUARY 16, TO MARCH 17, 1920. ARRANGED BY WEEKS. 341 CASES.



Black line=actual number of cases; Broken line=percentage of pneumonias; Light line=death-rate among pneumonias.

39 per cent. A very irregular curve, but one of the same general type, is shown during the secondary epidemic of December and January. Here again the percentage of pneumonia was highest some weeks after the decline in the epidemic, then fell abruptly, but remained above 40 per cent.

The death rate among the influenza-pneumonias, however, was highest during the first week and from then on the curve is almost exactly the reverse of the curve for the incidence of pneumonia. In other words, with a rapidly rising incidence of pneumonia among influenza cases there was a striking decline in the mortality. The death rate during the first week was 72.7 per cent., but by the eighth week had fallen to 38.5 per cent., and by the thirteenth to 20 per cent., which was the minimum for the entire epidemic period. With the onset of the secondary epidemic in December the death rate among the pneumonias again rose and after the decline in the epidemic in January, reached 66.5 per cent.

The number of deaths in the whole group of influenzas is essentially identical with that in the pneumonias as it seems probable that all fatal cases of the disease have a complicating pneumonia. Only four cases died without a diagnosis of pneumonia. The total death rate for the 740 influenza-pneumonias treated from September 3, 1918, to April 30, 1919, was 54.7 per cent.

Chart 2 covers the period of the minor epidemic of January and February, 1920. The curve showing the actual number of cases of influenza entering the hospital is an exact miniature of that for the first epidemic. The course of the incidence of pneumonia and the death rate in these cases, however, take an exactly opposite curve, namely, in the first epidemic the percentage of pneumonia increased steadily while the death rate declined, but in this last epidemic the percentage of cases gradually declined while the death rate rose rapidly after the third week. No secondary wave developed this year and after the rapid decline the disease gradually disappeared from the wards. The general mortality for the first week was only 21 per cent., but during the second week rose to 69 per cent. By the third week, however, it fell to 14 per cent. and remained low throughout the remainder of the epidemic. This marked difference in the death rate in the two epidemics is in accordance with clinical observations, the cases in the epidemic of 1920 being much more mild and developing fewer complications. From January 16 to March 11, 1920, a total of 341 cases of influenza were admitted, of whom 137, or 40 per cent., were complicated

with pneumonia. No deaths occurred among the uncomplicated cases. The general death rate for the 137 influenza-pneumonias was 38 per cent.

In every instance among the 273 influenza and influenza-pneumonia cases treated on the pneumonia service where sputum could be obtained the sputum bacteriology was determined. The following table gives the results in the 162 cases in which the sputum was examined. Almost every case yielded two or more organisms.

Table I.—Sputum Bacteriology of 162 Influenza and Influenza-Pneumonia Cases.

Organism	Influenza	Influenza-Pneumonia
Pneumococcus, Type I	0	3
Pneumococcus, Type II	0	1
Pneumococcus, Type III	2	16
Pneumococcus, Type IV	21	77
Streptococcus, hemolytic	1	21
Streptococcus, non-hemolytic	0	12
Streptococcus viridans	2	9
Staphylococcus aureus	0	18
Bacillus influenzae	14	73
Micrococcus catarrhalis	1	4

These cases were chiefly from the 1920 epidemic. Among the pneumonias of this group the organisms most commonly associated were pneumococcus type IV and the bacillus influenzae. The next most frequent finding was some combination of pneumococcus type III, staphylococcus aureus and hemolytic streptococcus. The almost entire absence of types I and II is striking.

In several instances what appeared to be a typical lobar pneumonia followed an unmistakable attack of influenza. We have often experienced great difficulty in differentiating a confluent bronchopneumonia occurring with influenza from a true lobar pneumonia. By reason chiefly of the more positive character and severer type of the influenza in the 1918-1919 epidemic less difficulty of this sort was experienced. A considerable series of cases which have been examined in the Pathological Department and the Medical Examiner's Laboratory have grossly and microscopically shown every possible gradation from the incomplete bronchopneumonia to the typical lobar form. If it has so frequently been impossible at the autopsy table to make a positive diagnosis of the variety of pneumonia it is not surprising that we have experienced difficulty at the bedside. In the group of 188 influenza-pneumonias 35.6 per cent. died.

The remarkable results obtained by McGuire and Redden (*Jour. A. M. A.*, 1918, lxxi, 1311; 1919, lxxii, 709) in the fall of 1918 with the use of convalescent human serum in cases of influenza-pneumonia encouraged us to employ the method. Unfortunately the service was not organized until after the epidemic had largely subsided and the number of cases available during the secondary epidemic in the winter and spring of 1919 afforded only a very limited opportunity for testing the value of the serum treatment. In conducting such an experiment we felt that the results could be of no scientific value unless accurately controlled. Cases were therefore paired on the basis of age, sex, length of illness, the character of the signs and severity of the symptoms, one case only of each pair receiving the inoculations. There were in all twenty-two of each group and the total number of deaths in each was ten, or, roughly, 45.4 per cent. Careful observations of the cases and their controls failed entirely to afford any evidence of benefit in the treated cases. The series is obviously too small to warrant any definite conclusions. On the basis of such a limited experience with the convalescent serum treatment we do not feel justified in condemning it as of no value. It is only possible to state that we have failed to obtain any positive results. It was our intention to continue the investigation during the past winter, including careful bacteriological studies of the donors and patients. During the epidemic of 1920 we succeeded in obtaining two liters of serum, but the atypical forms of pneumonia made the diagnosis of influenza-pneumonia very uncertain and this together with the short duration of the epidemic prevented us from securing the necessary clinical material.

Bronchopneumonia.

Primary bronchopneumonia in adults was, before the war, very rarely observed in hospital practice, but during the past few years has been seen with surprising frequency, as evidenced by the fact that among 1,078 cases treated on the pneumonia service in fifteen months, 164 were of this type. In the fall of 1917 large numbers of bronchopneumonia cases, for the most part due to the hemolytic streptococcus, and often complicated by a streptococcus empyema, were reported from the southern army cantonments. These early cases usually developed as a complication of measles, though in

some camps there was an epidemic of primary pneumonia of this type. During the spring of 1918 similar cases were observed in large numbers in other army camps scattered all over the country and to a less extent in civil communities as well. With the appearance of the influenza epidemic in the fall of 1918, the disease became widespread and was met with in all civilian hospitals. Throughout the winter of 1919 streptococcus bronchopneumonia was again very prevalent in the civilan population and an unusual opportunity was offered for the study of the disease side by side with lobar pneumonia. Its early recognition is especially important by reason of the frequency of a complicating streptococcus empyema which appears very early in its course, often developing on the second to fourth day of the pneumonia.

Thirty of these cases were studied intensively during December, January and February of the past winter. These were considered examples of primary bronchopneumonia as distinguished from the bronchopneumonia secondary to influenza, a differentiation which is exceedingly difficult and often impossible during a period when influenza is epidemic, as was the case during the past winter. In a majority of this group the history was quite characteristic. The onset was gradual, beginning with a cold or sore throat associated with malaise. The usual story was that the patient continued at work for a few days to a week until the cough, malaise, headache, fever and pain in the chest became so severe that he was obliged to go to bed. In other words, in contrast to lobar pneumonia the infection in the lungs seems to follow an infection of the upper respiratory tract. The prodromal stage is variable, lasting from one to several days or even two weeks. The average in the thirty cases studied was four days. There were five cases which did not conform to this type. In these the onset was abrupt, with a chill, cough, and pain in the chest. The cough appears early, is at first painful and unproductive, but soon is accompanied by a mucoid sputum which is often blood tinged but never conspicuously tenacious as in lobar pneumonia. Pain is a common and often distressing symptom. It is usually localized over the lower half of the chest, rarely under the sternum. Pains in the back and legs are more frequent than in lobar pneumonia but less prominent than in influenza. A pleural rub is occasionally heard. Delirium is much more rare than in lobar pneumonia. Frequently during the course of the disease chilly sensations are felt and not uncommonly an actual rigor occurring some days after the appearance of the symptoms in the upper respiratory tract seems to mark the onset of the involvement of the lungs. Dyspnoea of some degree is almost always present and frequently very severe. The temperature is elevated but less regular than in ordinary pneumonia and nearly always falls by lysis. The pulse is elevated and respiration much increased, in the cases of severe dyspnoea sometimes reaching sixty or seventy. Prostration is often profound. Cyanosis is occasionally seen. Herpes is rare.

The following table gives the symptoms in their order of frequency in the cases studied:

Table II.

Cough	23
Pain in the chest	21
Headache	16
Chill	14
Fever	13
Bloody suptum	12
Pain in limbs	9
Anorexia	8
Dsypnoea	8
Chilliness	5
Vomiting	5
Tiredness	5
Weakness	4
Sore throat	4
Back-ache	4
Eye-ache	4
Sub-sternal pain	1

These symptoms as tabulated do not differ very materially from those of lobar pneumonia, but the mode of onset as emphasized above is as a rule quite distinct.

The sputum bacteriology of the entire group of 164 bronchopneumonias is given in the following table:

Table III.—Bacteriologic Examination of the Sputum.

Pneumococcus, Type I	2
Pneumococcus, Type II	4
Pneumococcus, Type III	18
Pneumococcus, Type IV	43
Streptococcus, hemolytic	30
Streptococcus, non-hemolytic	2
Streptococcus viridans	14
Staphylococcus aureus	19
Bacillus influenzae	44
Unclassified and unknown	53

The results are somewhat confusing, as in many cases several organisms were present. Any final grouping of all cases according to the organism found is impossible. The above described variety due to the hemolytic streptococcus gives the most definite clinical picture and seems to represent a distinct group. The

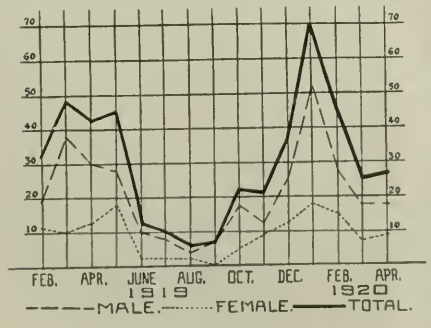
non-hemolytic streptococcus was found in only two cases. It is generally accepted that the streptococcus viridans may be an occasional cause of bronchopneumonia, but its presence in the sputum is not sufficient proof of its etiological importance. In several instances including both fatal and non-fatal cases, we have obtained the organism in anti-mortem lung puncture. The influenza bacillus was the most frequent single organism found, but it has almost invariably been associated with some other pathogenic bacteria. Types III and IV pneumococci were obtained very commonly, as is shown in the above table. The former seems to be the organism present in a majority of the cases of the "migratory" form of bronchopneumonia. One of the most interesting groups is that due to the staphylococcus aureus. They conform very closely to the clinical and pathological type described by Chickering and Park (*Jour. A. M. A.*, 1919. LXXII, 617). Four of this last mentioned group developed empyema, two of whom died. The rarity of types I and II pneumococci in the sputum is very noticeable. It is interesting that thus far we have not seen a single case of bronchopneumonia which has proved pathologically to be due to either of these types of pneumococci.

LOBAR PNEUMONIA.

Chart 3 gives the incidence by months, arranged according to sex, of the 447 cases of lobar pneumonia treated from February 3, 1919, to April 30, 1920. It is interesting to note that in both years the marked rise in the number of pneumonia cases was principally due to the increase in the number among males.

CHART III.

INCIDENCE BY MONTHS OF LOBAR PNEUMONIA (447 CASES) FROM FEBRUARY 3, 1919, TO APRIL 30, 1920.



The total case fatality for the 447 cases was 25.5 per cent. The death rate among 574 cases of lobar pneumonia treated in the City Hospital during the year 1916 was 39.4 per cent. and for 774 treated during the year 1917, 36.3 per cent. The well-known variation in the virulence of the infection from year to year and the resulting variation in the death rate may to some extent explain the sharp drop to 25.5 per cent., but is not sufficient to fully account for it. Likewise the reduction in the number of deaths in type I cases treated by antipneumococcus serum to be discussed later is obviously a factor. We believe it not unreasonable to assume that the advantages resulting from the treating of all cases of pneumonia on a single service has contributed in lessening the number of fatal results.

A type pneumococcus was recovered in 335 cases. In Table IV the bacteriologic findings are combined to show the incidence of the various type pneumococci in two sexes.

TABLE IV.—FOUR HUNDRED AND FORTY-SEVEN CASES OF LOBAR PNEUMONIA ARRANGED TO SHOW RELATIVE FREQUENCY OF THE TYPES OF PNEUMOCOCCI ACCORDING TO SEX.

	Type Pneumococcus				Unclassified	Mortality per Cent.	Totals
	I	II	III	IV			
Male	87	62	31	64	73	26.5	317
Female ..	29	9	18	35	39	23.0	130
Totals ..	116	71	49	99	112	25.5	447

It will be noted that males suffered relatively more from types I and II, and females relatively more from types III and IV infection. A possible explanation of this interesting difference in the sexes with respect to the type organism found is that types I and II are present only in the mouths of individuals convalescing from such infection or recently in contact with types I and II cases, while types III and IV are very commonly found in the mouths of healthy individuals (Dochez and Avery, *Jour. Exper. Med.*, 1915, XXII, 105; Stillman, *Jour. Exper. Med.*, 1916, XXIV, 651). The women who spend relatively much more time at home do not come in contact with types I and II carriers as do the men, and consequently when pneumonia develops in women the infection is more often due to the common mouth organisms.

During the winter months infection with the various types of pneumococci seem to occur in waves suggesting small epidemics, but no epidemiological investigations were undertaken

and this occurrence may be purely a coincidence.

Among the 353 cases of lobar pneumonia in adults the type pneumococcus was determined in 293. These results are given in Table V.

Table V.—Lobar Pneumonia in Adults (293 Cases).

Type Pneumococcus	No. Cases	Per Cent.	Mortality per Cent.
I	105	36.0	22.8
II	66	22.8	31.8
III	45	15.0	46.2
IV	77	26.2	27.2

The relative frequency of the various types is not unusual and the mortality in the different groups does not show any significant variation from the figures for most other clinics, except for a rather high death rate in type IV cases.

Lobar pneumonia as seen in infants and children was a comparatively mild disease. Considerable difficulty was encountered in obtaining sputum for examination from the younger children, and in consequence only 42 of the total of 94 patients under fifteen years were typed. The results are as follows:

Table VI.—Lobar Pneumonia in Children (42 Cases).

Type Pneumococcus	No. Cases	Per Cent.	Mortality per Cent.
I	11	26	9.9
II	5	12	0.0
III	4	10	0.0
IV	22	52	4.9

The most noteworthy feature of these figures is the high percentage of type IV infections. The mortality per cent. is misleading. Only two of the above group died, one with type I and the other with type IV infection. A complicating laryngeal diphtheria in the first and acute nephritis and pleuritis in the second probably accounts for the fatal termination. Only two of the fifty-two cases in which the organism was unknown died. By reason of the extremely low mortality no antipneumococcus serum treatment was attempted in infants under five years. The few cases of older children treated with serum all recovered.

From February 3, 1919, to April 30, 1920, a total of 132 pneumonias were proved to be due to type I pneumococcus. With a very few exceptions all cases, including the moribund ones, were treated with the antipneumococcus serum as soon as the laboratory report was received, provided the patient had not had a crisis. The total treated by this method was 75, and the untreated 57. The technique used in the administration of the serum is the same as that developed at the hospital of the Rockefeller Institute (Monograph No. 7, Rockefeller Institute for Medical Research, 1917).

The paramount importance of the early administration of the serum is well shown in the following table:

Table VII.—Death Rate among Serum Treated Cases.

	No. Cases	No. Died	Mortality per Cent.
Treatment started on 2nd day	1	0	0.0
Treatment started on 3rd day	7	0	0.0
Treatment started on 4th day	13	2	15.4
Treatment started on 5th day	13	1	7.7
Treatment started on 6th day	9	2	22.2
Treatment started on 7th day	13	2	15.4
Treatment started on 8th day	8	3	37.5
Treatment started on 9th day	4	1	25.0
Treatment started on 10th day	3	1	33.3
Treatment started on 11th day	1	1	100.0
Day of disease not known	3	0	0.0
Totals	75	13	17.3

It seems very significant that among the fifty-six who were treated during the first week of the disease only seven, or 12.5 per cent., died. The death rate for the whole group of seventy-five treated cases was 17.3 per cent. and for the 57 untreated 26.3 per cent. These results, which accord with the experience of others, are strong evidence of the efficacy of serum treatment of type I pneumonia. The fact should be most strongly emphasized that the earlier the treatment is begun the more prompt and favorable are the results. It seems quite questionable if this method is of any value when employed later than the seventh day. Often after a single intravenous injection of 100 c.c. the temperature fell to normal and remained so. In other cases several injections at eight-hour intervals were necessary. The largest amount of serum given was nine doses of 100 c.c. each. The average of serum per patient for the seventy-five treated cases was 197 c.c.

We have noted, as has previously been observed, that those patients who have a marked thermal reaction following the serum injection seem to derive more benefit from the treatment than those who have no reaction. Bull and Bartnal (*Jour. Exp. Med.*, 1920, xxxi, 233) have shown that the inhibitory action of whole blood on the growth of pneumococci is partly dependent on the presence of a sufficient number of leucocytes. These two considerations led us to study the leucocyte reaction following the use of the antipneumococcus serum. Eight cases were carefully studied with reference to

the course of the leucocyte curve immediately following this form of treatment. Seven of the eight patients experienced a prompt thermal reaction after the injection and in five of the seven the reaction was accompanied by a severe leucopenia followed by a leucocytosis. This same course in the leucocyte curve has been observed to occur coincidently with a similar thermal reaction following the injection of other foreign proteins (Gay. Typhoid Fever. The Macmillan Co., N. Y., 1914, p. 168; Scully, *Jour. A. M. A.*, 1917, LXIX, 20). The five cases which reacted in this way showed an immediate striking improvement after one or two doses of serum. In the sixth case the white count was 29,000 per c.mm. before treatment and no essential change occurred in the count after the chill following the serum injection. The temperature fell rapidly, reaching normal in twenty-four hours. A few hours after the temperature reached normal the number of leucocytes diminished. In the seventh case the leucocyte count fell from 23,000 per c.mm. to 13,000 per c.mm. after the first injection and did not increase during the remainder of the treatment. Five doses of serum were given before the temperature reached normal. The single case in which no rigor took place had a white count of 11,000 per c.mm. The count remained low and the patient died after the fifth dose of serum.

Our observations seem to indicate:

1. That patients who have a chill following intravenous serum treatment usually show a few hours later a hyperleucocytosis and these cases react more favorably than do those who have no chill.

2. In cases with a high leucocyte count the maintenance of the leucocytosis or an increase following serum treatment is to be interpreted as a very favorable prognostic sign.

3. Patients whose white count is markedly depressed by the serum or in whom an original leucopenia is not replaced by a leucocytosis after the injection do badly under serum treatment.

We believe it reasonable to conclude that the presence of an increased number of leucocytes is a necessary part of the mechanism of recovery in cases treated with antipneumococcus serum. It seems probable that the cases in whom the administration of the serum fails to produce an increased leucocytosis or is followed by a depression in the number of white cells suffer from a degree of toxemia too great to permit a reaction to the serum. The value of this foreign protein reaction is an interesting subject for experimental study.

BLOOD CULTURES.

In all a total of 302 blood cultures were made with positive results in 21.2 per cent. This small percentage of positive results is largely due to the considerable number of influenza-pneumonia and bronchopneumonia cases included in the series. A summary of the positive findings is given in Table VIII.

TABLE VIII.—POSITIVE BLOOD CULTURES.

	No. Cases	Deaths	Mortality per Cent.
Pneumococcus, Type I..	18	10	55.5
Pneumococcus, Type II.	9	7	77.7
Pneumococcus, Type III	12	11	92.4
Pneumococcus, Type IV	10	7	70.0
Streptococcus, hemolytic	6	6	100.0
Streptococcus viridans.	1	1	100.0
Staphylococcus aureus.	8	6	75.0
Bacillus coli communis	1	1	100.0

The rather surprising fact that of eighteen type I pneumococci with positive blood culture only ten died is probably to be explained by the fact that fourteen were treated with antipneumococcus serum, seven recovering.

WASSERMANN REACTION.

False positive Wassermann reactions obtained during the febrile period of acute infections have been mentioned (Golden, G. M.; *Hahneman Mouth.*, Phil., 1918, LIII, 728). We have taken blood for this test in 363 cases. Of these 320 were negative, 33 were persistently positive, four were doubtful, and only six were falsely positive, *i.e.*, positive during the febrile stage and negative during convalescence. That these are actually false positive reactions can be proved only by the absolute exclusion of syphilis. We are not in a position to do this and we have, therefore, no statements to make except that (1) false positive Wassermann reactions during the febrile period of pneumonia are rare; (2) latent or cured syphilis may possibly give a positive reaction only during the febrile period.

LUNG PUNCTURE.

A report of the study of 73 lung punctures performed in lobar pneumonia cases on this service was recently published. (Thomas, H. M., Jr., and Parker, F., Jr., *Arch. Int. Med.*, 1920,

xxvi, 125.) This procedure was done to hasten or confirm the bacteriological diagnosis and proved to be of considerable value clinically. The question has perhaps naturally been raised, Is this method of examination free from dangers to the patient? Theoretically, the infection of the pleura might result or the injury to the lung by the needle possibly lead to local softening and abscess. Empyema developed in only two of the seventy-three cases, or 2.7 per cent., an incidence rate which is less than half of that for the entire group of 447 lobar pneumonias. Lung abscess did not develop in a single instance, neither was any other ill effect ever observed. Furthermore, if carefully done, the introduction of a needle into the lung causes the patient almost no pain. On the basis of this experience we feel justified in concluding that lung puncture is an entirely innocuous procedure.

It was found that the mortality of cases yielding viable organisms by lung punctures after the fifth day of disease was 56 per cent., whereas cases yielding no organisms by lung puncture, irrespective of the day of the disease, with only two exceptions, recovered, or a mortality of 6.5 per cent. Positive lung punctures were obtained, however, just before, during and immediately following crisis in a few cases. These facts seem to indicate that destruction of the organisms is the first step in the process of recovery, but also that crisis may occur before the organisms have been entirely killed, or not until several days after. That definite anti-bacterial properties are developed in the blood has been shown by many investigators but that these properties are in any way important in combating the toxic manifestations of lobar pneumonia has not been claimed.

Our results seem to indicate the existence of both an anti-bacterial and detoxifying mechanism which are active in the process of recovery which act, in a measure, independently. The rate of development of anti-bacterial bodies, on the one hand, and the detoxifying mechanism, on the other, may occur simultaneously or not, according to factors which influence their separate production differently. The work of many investigators suggests that detoxification may occur by a sudden change in the ferment-anti-ferment balance, but the possibility of a true toxin-anti-toxin reaction has not been definitely ruled out.

EMPYEMA.

During the period covered by this report a total of sixty-six cases of empyema were treated. Table IX gives the results of bacteriological studies of the exudate, the type of pneumonia and the mortality of this group.

Table IX.—Sixty-six Cases of Empyema Grouped According to the Type of Primary Pneumonia, Showing the Organism Found and the Mortality in Each.

	Lobar Pneumonia		Broncho-Pneumonia		Post-Pneumonia		Total		
	No.	Died	No.	Died	No.	Died	No.	Died	Mort.
Pneumococcus, Type I	14	2			6	1	20	3	15.0
Pneumococcus, Type II	3	2					3	2	66.6
Pneumococcus, Type III	1	0			1	0	2	0	0.0
Pneumococcus, Type IV	5	0			1	1	6	1	16.6
Pneumococcus unknown					2	0	2	0	0.0
Streptococcus hemolyticus			10	5	11	3	21	8	33.3
Streptococcus non-hemolyticus			1	0	3	0	4	0	0.0
Staphylococcus aureus			2	2	2	0	4	2	50.0
Undetermined					4	0	4	0	0.0
Total	23	4	13	7	30	5	66	15	22.7

It will be seen from the above table that all of the empyemas following lobar pneumonia were due to the pneumococcus, while in the case of empyemas occurring with bronchopneumonia none was caused by this organism. Two cases of this second group showed staphylococcus aureus but all the remainder were due to the streptococcus. The first group comprises twenty-three and the second group thirteen cases. The thirty cases grouped in the tables under post-pneumonia were all admitted to the hospital for empyema and too late in the course of the disease to determine the form of the primary pneumonia. So constantly, however, does the pneumococcus empyema complicate lobar pneumonia and the streptococcus empyema a bronchopneumonia that there would seem to be

but little if any doubt that the two cases showing pneumococci in the pleural exudate were secondary to lobar pneumonia and a majority of the remaining twenty which showed streptococci were secondary to a bronchopneumonia. These figures are in accord with the general conception of empyema as conforming to two most common types, namely, (1) pneumococcus empyema following lobar pneumonia, and (2) streptococcus empyema following bronchopneumonia.

Among the total 447 lobar pneumonia cases 5 per cent. developed empyema while the 352 bronchopneumonias (including the 188 influenza-pneumonias) showed only 3.7 per cent. incidence of empyema. The former is within normal limits but the latter seems surprisingly low.

The mortality in the group of thirty-two pneumococcus empyemas was 18.1 per cent. and in the group of twenty-five streptococcus empyemas 28 per cent. The high mortality in the second group is usual and is probably due chiefly to three factors: first, the general virulence of the infection; second, the early recurrence of the empyema which, as a rule, develops while the intrapulmonary process is in an active stage, and third, the frequency of other complications due to the same organism, such as infection of other serous cavities and the mediastinum, abscess of the lung, endocarditis, meningitis, nephritis and septicaemia. If we take the figures for the known group of twenty-three lobar and thirteen bronchopneumonia cases we find a mortality for the empyema of 17 per cent. for the first and 69 per cent. for the second. The mortality for the entire group of sixty-six cases was 22.7 per cent. and for the fifty-five operated cases 20 per cent. There seem good reasons for assuming that the epidemic of influenza and the extraordinary prevalence of broncho-pneumonias in the period to which these figures apply have been factors of considerable importance in maintaining this relatively high death rate in empyema.

In deciding when the patient with empyema should be operated we have been guided by two considerations, (1) the type of infection, and (2) the general condition of the patient, especially with reference to the stage of the pneumonia. As a rule, in the case of pneumococcus empyema, when frank pus is present, an immediate operation has been advised provided the condition of the patient is satisfactory. Unquestionably the patient's chances are much better if he has reached the point of at least early convalescence from his pneumonia. Fortunately infection of the pleura with the pneumococcus is usually a late complication and empyema does not in consequence develop until the acute stage of the pneumonia has passed. When severe toxic or mechanical symptoms are evidently due to the empyema then drainage of the cavity should be effected without delay.

Empyema due to the streptococcus very frequently develops during the early stages of the bronchopneumonia and the situation is then a serious one. The infection appears suddenly and the effusion often accumulates very rapidly. Early operation in these cases means a very high mortality as the patient is apt to be extremely toxic and in no condition to stand surgical treatment. Aspiration often affords the patient great relief and the toxemia promptly diminishes. By simple aspiration of the chest every one to three days it is usually possible to postpone the operation until the patient's condition is more favorable.

A discussion of the operative technique and the results obtained with the various methods of drainage will be given in a surgical report now in preparation.

INTRACISTERN INJECTIONS OF SALVARSANIZED SERUM IN NEUROSYPHILIS.*

BY HENRY MCCUSKER, M.D., PROVIDENCE, R.I.

[Clinical Laboratory, Butler Hospital.]

SINCE the beginning of the use of salvarsan therapy, Butler Hospital has made a special effort to overcome the previous unfavorable results in neurosyphilitic treatment. Intravenous, intraspinous, and intraventricular methods have been used. At first intravenous therapy alone was the rule. Later on the method of Swift-Ellis was adopted. In 1916 a publication was issued from this hospital on this latter method of treatment in general paresis and great results were predicted. A separate publication will show the unfavorable end-results in these cases.

We have also tried intensive intravenous therapy with routine lumbar drainage of the spinal fluid. On several occasions intraventricular therapy has been used.

Every one of these methods offered hope at first but our statistics show that they were dis-

* Read before the Providence Medical Society at a regular monthly meeting.

appointing in their results. The introduction into the ventricles of salvarsanized serum was the most promising but this necessitated trephining and was not resorted to in early cases on account of the disfiguring trephine scars. It still has merit.

The excellent work of Ayer and others in showing the ease with which the cisterna magna can be drained in meningitis and other diseases opens up a new avenue of approach in the treatment of neurosyphilis. We have attempted, therefore, cistern puncture with the replacement of the fluid by diarsenolized serum.

I am presenting the following case, by way of preliminary report, to show the application of the method and with the hope that it may stimulate like work by others. The case selected is that of a patient who has a definite history of syphilis of long duration and who, in addition to the routine treatment following the primary lesion, had intraspinal therapy several years later for the relief of tabetic pains. For the past several years he has had treatment at one of the favorite Springs. At the present time his blood Wassermann is negative and the spinal fluid Wassermann is ++++. In addition to these serological findings he also has somatic signs of neurosyphilis.

On account of the patient's activity, light chloroform anesthesia was used. The patient was placed on his side and his head flexed on his chest with the occipital protuberance on the same horizontal plane as the spinal column. An ordinary lumbar-puncture needle of 18-gauge and graduated in centimetres was used. The technique used in the puncture is the same as that in use by Ayer at the Massachusetts General Hospital.

By palpation with the thumb a depression may be felt below the occipital protuberance in the median line. By pressure the spine of the axis may be palpated and just above it "a definite soft spot may be felt," which is the area between the lower margin of the base of the skull and the spine. With the thumb of the left hand pressing firmly into this depression, the needle in the right hand was introduced into the skin in the median line of the back of the neck and in the space between the base of the skull and the axis. The direction of the needle was slightly upward and in the line of a plane passing through the glabella and the upper edge of the external auditory meatus. As the needle was pushed forward, the resistance of the dura and of the posterior occipito-atlantoid ligament, which extends between the posterior margin of the foramen magnum and the posterior arch of the atlas, were felt plainly to be overcome. With the needle inserted at a distance of 5 cm. fluid was obtained. After estimating the pressure (140 mm.), 15 cc. of fluid was withdrawn and 15 cc. of diarsenolized serum was introduced slowly by the gravity method. The patient recovered from the anesthesia while on the table and has suffered no ill after-effects.

Cadaveric and living experimentations have shown that a needle inserted to a depth of 4 to 5 cm. would enter the cistern and allow over 1 cm. clearage of the medulla.

To some men occipito-atlantoid puncture may appear as a radical procedure but in the light of the experimental work of Ayer, Wegeforth, and Essick, at the Army Neurosurgical Laboratory and of the practical work of Ayer at the Massachusetts General Hospital, it appears as a procedure with a percentage of danger no greater than that in lumbar puncture.

SUMMARY.

1. Cistern puncture offers another route of application in the method of therapy in syphilis of the central nervous system.
2. It gets the serum nearer to the seat of the disease.
3. It is easier to accomplish than a spinal tap.
4. It offers no more danger than rhachicentesis.

ORCHITIS IN MUMPS.

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[From the Evans Memorial Hospital, Boston.]

(Continued from page 461.)

ATROPHY OF THE TESTICLE.

Within four weeks to six months after the acute orchitis, an examination of the genitals may reveal a diminution in the size of the affected testicle and a change in the consistency, which may be roughly described as a softening or increased compressibility. An atrophy has taken place as the result of the necrosis incurred during the acute stage, the degree of

atrophy depending upon the amount of destruction at this time. Stolz[68] reports a case of complete atrophy of the testicle where castration was performed for relief of symptoms. Sections showed a general and equal necrosis, which he considers must have taken place suddenly and in a short time. There was fatty degeneration in the center with partial hyaline degeneration at the periphery. Hall[45] studied a mumps atrophied testicle found at autopsy.*

In this case the patient had had orchitis with mumps within a year of his death, which followed an operation on the intestines.

The epididymis and vas deferens were normal. The testicle was distinctly diminished in size, the tunica vaginalis was normal, and the surface of cut sections had a granular appearance. Histological examination revealed areas of healthy tissue with the seminiferous tubules carrying on normal spermatogenesis and the production of countless spermatozoa. The atrophied portions showed a fibrosis, with partial and complete destruction of the seminiferous tubules, often surrounded by a hyaline limiting membrane, *membrana limitans interna*. He describes the condition as *zarte Fibrosis*, and suggests that the numerous cases of this condition in the testicle found at autopsy are probably in the majority of incidences the result of mumps.

Dieulafoy[69] gives the following account of the findings of an earlier author:

"Malassez had occasion to examine an atrophied testis. The epididymis was healthy; the seminiferous tubules were reduced to half of their size; some were converted into cords, while others presented some epithelial débris at their center; so that the lesion was a kind of parenchymatous orchitis, the vessels and connective tissue being practically spared."

In the great majority of cases in which atrophy develops there are no symptoms except the diminution in size of the gland, which, if slight, may entirely escape the notice of the patient. In some cases, however, the patients complain of a vague disagreeable sensation in the degenerated testicle, and in a few cases we get intense neuralgic pain. Others show a temporary decrease of sexual appetite with a diminished ability to perform coitus, or actual sterility may take place. Still more rarely we have a tendency to the development of a condition described as "feminism." These marked effects upon the sexual function are invariably the aftermath of severe double orchitis. In general, it may be stated that the more severe the orchitis the greater the tendency to subsequent atrophy, and also that the degree of atrophy is proportional to the severity of the symptoms of the orchitis. This, however, is by no means the rule, since marked atrophy of a testicle may develop from a comparatively mild orchitis so far as pain is concerned. It is barely possible that the strain of the infective organism may have some bearing on the incidence of atrophy, just as it may be concerned in the incidence of the orchitis itself, as shown by the variance in different epidemics and even during the same epidemic.

The discrepancies in the reports of different observers suggests a wide variation in the conception of what constitutes atrophy. Probably any change in the consistency of the testicle which can be determined any time after six weeks from the acute stage, constitutes the results of necrosis, and should be termed atrophy. Many authors reserve the term atrophy for an appreciable diminution in the size of the testicle. Consequently the incidence of atrophy in the sense of anything from partial to complete is probably much greater than the sum total of the statistics which I have collected. It need not be inferred, however, that orchitis always results in an appreciable necrosis, because, so far as careful examination can determine, a testicle which has swollen to twice its original volume may return to its normal size and consistency and remain so.

From the accompanying table it will be seen that out of 347 cases of orchitis, a subsequent examination revealed the development of atrophy in 190 of these cases or in 54.7%.

The degree of atrophy can be gauged only approximately. Thus, Settekorn[71] found that out of twelve atrophies, one testicle was "completely atrophied," three testicles showed a reduction to one-third their original volume, and eight showed an appreciable reduction with softening. Laurens,[29] out of sixteen atrophies, found the testicle reduced to three-quarters of the original volume in two cases, to one-half in seven cases, and to one-quarter, together with a softening of the substance of the gland, in seven cases. Among these sixteen, nine showed more or less decrease in sexual appetite, three showed considerable loss of sexual powers, and six showed an appreciable loss of the same. Gerard* reports that in one case of double

Gerard[34], *op. cit.*, p. 502.

TABLE V.

TESTICULAR ATROPHY FOLLOWING MUMPS ORCHITIS.*

AUTHOR	REFERENCE	ORCHITIS	ATROPHY
Settekorn	71	13	12
Soltmann	23	9	5
Granier	24	115	51
Servier	26	26	12
Martin	27	9	6
Laurens	29	32	16
Jouloux	30	14	14
Chauvin	31	16	6
Jourdan	32	11	10
Gerard	34	13	6
Chatain†	1	9	3
Dogney†	1	27	27
Madamet	33	7	4
Calmette	28	10	3
Antony	37	7	0
Helber	39	4	4
Sorel	56	15	6
Heller	61	10	5
TOTAL		347	190

* In this table I have been careful to give only the number of cases of orchitis which each author examined later for atrophy. The examinations were made anywhere from six weeks to four years after the orchitis took place. With the possible exception of Chatain, these are all from military sources.

† Comby collected 163 cases of orchitis followed by 103 cases of atrophy (63%). Except for Chatain and Dogney, the original articles have been found and the figures taken from them.

Kocher[10] states that atrophy occurred in 23 cases out of 79, but it is not clear that these were original, or whence he obtained the figures. He cites Lawrence as giving 16 atrophies out of 32 cases of orchitis, which are probably the figures of Laurens. No reference is given. Consequently, I do not include Kocher's figures.

atrophy the function was diminished but not completely abolished.

An instance of sterile marriage as the result of mumps is recorded by Giovanni.[72] The husband, aged 30, was a healthy and robust peasant with nothing of apparent importance in his past history. At 26 he had married a healthy and robust girl whose past history was also negative. As the marriage proved sterile the wife was subjected to all sorts of gynaecological treatments, but to no avail. Finally the seminal discharge of the husband was examined microscopically and found to be "absolutely sterile." A more careful past history then disclosed that at the age of 16 the husband had had a severe parotitis epidemica complicated by a bilateral orchioepididymitis. Careful examination revealed a considerable degree of atrophy of both testicles with induration of the epididymis.

Comby† cites a case of "feminism" of tem-

Comby[3], *op. cit.*, pp. 113, 114.

porary duration. The patient was presented before the Société Médicale des Hôpiteaux de Paris in August, 1877, by Lereboullet.

A soldier, aged 22, of good physique and normal sexual powers, was seized with parotitis (apparently unilateral), without fever and without much pain. Four days after the height of the parotid swelling, both testicles were attacked. In three or four days they were swollen to three times their original volume, with only moderate pain. The epididymis was not affected. After twenty days both testicles atrophied completely, and the mammary glands enlarged. At the time of presentation of the case (three months after the parotitis) complete atrophy of both testicles and enlargement of the mammary glands were demonstrated, as was the absence of a beard and of hair on the chest. "The penis is well developed, and the pubic hair is normal; but all sexual appetite has disappeared; the erections, formerly frequent and followed by ejaculations, are no longer possible to produce."

Four years later Laveran examined the patient, but could not determine the persistence of "feminism." The mammary glands particularly were found to be normal. The testicles were atrophied and reduced to the size of beans. The patient, who confessed impotence and absolute frigidity, was invalided to Constantine on account of his testicular atrophy. No further account of the case is given.

A recent case was presented to the same society in July, 1917, by Laignel-Levastine and Courbon.[73]

A soldier, aged 22, who previously to mumps was of fairly good physique, took an active part in athletic games, and had proved himself to be capable of sexual intercourse "many times a night and several times a week," was seized with a violent attack of mumps with a bilateral orchitis and meningitis. This was followed by a progressive atrophy of the penis and both testicles and hypertrophy of the mammary glands. The patient lost all interest in sports, and acquired a feminine manner. However, he was still capable of sexual excitement in the presence of his mistress, but could perform coitus only occasionally, and after each time was abnormally weakened. The case was presented seven months after the acute period of the parotitis and orchitis, and no further mention of the case can be found.

I have given these two cases in detail, because they are the only two cases of so-called feminism as the result of mumps which I have been able to gather from the literature. From a physiological standpoint it is difficult to understand why destruction of both testicles at the age of twenty-two should bring on feminine characteristics. Castration at this age does not

have this effect.* Were such complete atrophy

"It is perhaps well to point out that castration never induces a condition in any respect resembling the female type: the condition is infantile and not female." (Vincent, S.: Internal Secretion and the Ductless Glands, New York, 1912, p. 69).

In a castrated animal the accessory sexual glands atrophy and, if the operation is performed before puberty, they do not develop (Tigerestedt, R.: Text-book of Physiology. Trans. Martin, New York, 1906, p. 692).

"In those abnormal cases in which testicular growth is arrested, the prostate remains in a condition of rudimentary development . . . . It has been found also that the prostatic tubules disappear almost entirely in castrated animals, and what is left of the epithelium completely loses its secretory function." (Marshall, F. H.: Physiology of Reproduction, London, 1910, p. 239.) It is a disputed question whether Cowper's glands atrophy after castration. (*Ibid.*, p. 240.)

Castration does not by any means ensure a checking or complete loss of the sexual desire, nor does it stop the possibility of coitus (erection and ejaculation the latter emanating from the prostate and Cowper's glands, if these do not atrophy). (Nagel, W.: Handbuch der Physiologie des Menschen, Braunschweig, 1907, p. 41; Luciani, L.: Human Physiologie. Trans by Welby, London, 1917, Vol. iv, p. 78.)

of both testicles to occur before puberty one would expect the development of characteristics of a eunuch, but mumps is so rare before the age of puberty that no eunuchs as the result of mumps have ever been described. Furthermore, even if a small portion of healthy testicular tissue remained, it would allow the secondary male characteristics to develop.* The

When a portion of a testicle is allowed to remain after castration, the chicken does not develop into a capon. (Nagel, W.: *op. cit.*, p. 42.)

"feminism" in the first case was temporary; it may yet prove to be so in the second case, since the man was not rendered completely impotent, as was the first one. Certainly if impotence did develop in the second case, sexual excess might be considered as a possible factor.

The fact that these feminine characteristics may be of temporary duration is interesting and leads to a discussion of a possible compensatory hyperplasia of the normal testicular tissue in the presence of partial atrophy.† Both Jouloux

"A congenital one-sided atrophy," *i. e.*, a well-marked smallness of one testicle, is not infrequently observed in otherwise quite vigorous individuals, and not rarely in combination with a particularly strong compensatory development of the other healthy testicle." (Posner, C., in Health and Disease in Relation to Marriage and the Married State. Senator and Kaminer, New York, 1905, Vol. ii, p. 701.)

and Laurens observed a compensatory enlargement of the intact testicle after unilateral atrophy from mumps.‡ Others have noted

Jouloux[20], *op. cit.*, op. 482; Laurens[20], *loc. cit.*

that a partially atrophied testicle may in the course of time increase in volume.§

Laveran,[3] *op. cit.*, p. 68.

In the reports on specimens of atrophied testicles there is nothing said regarding the histological findings suggestive of the presence of such a hyperplasia, although no remarks are made that this was looked for.* Many observ-

Should a compensatory hyperplasia be found, it would be of considerable importance to know whether this took place in the reproductive cells lining the seminiferous tubules or in the interstitial tissue constituting what Steinach has termed the "pubertal gland."

In this connection it is interesting to note that "Lode found that in castrated bulls, horses, and guinea pigs the glandular epithelium of the seminal vesicles atrophied but the connective tissue underwent hyperplasia." (Marshall, *op. cit.*, p. 234.)

ers remark that when the sexual function has diminished with the development of testicular atrophy, this function may gradually increase again, and even return to its former state. The testimony in favor of a compensatory hyperplasia, as suggested by Schottmüller, is based upon individual observations not checked by measurements, and upon statements of patients regarding their relative sexual powers at different times, which, since many of the cases were unmarried soldiers, would vary according to circumstances of a complex nature, both physical and psychological, and quite apart from the results of the disease. The lack of evidence from microscopical examinations throws doubt upon the theory that there is an actual compensation from the histological point of view. From a functional standpoint there may be a compensation without evidence of hypertrophy or hyperplasia. Suffice it to say that diminished sexual power developing with testicular atrophy after mumps, does not signify in the great majority of cases a progressive loss of the sexual function to the stage of complete impotence. That this may take place is undeniable in view of Stolz's report of a complete unilateral atrophy as shown by the pathological findings, the case of complete loss of sexual powers after bilateral atrophy cited by Comby, and the case of sterility recorded by Giovanni. However, the rarity of this complete destruction of all the testicular tissue warrants a favorable prognosis. In fact, it is the physician's duty to assure the patient in a most positive manner that he will regain his sexual powers, in order that fear of impotence may not act as an inhibition on an already embarrassed sexual apparatus.

(To be continued.)

CHOLERA IN KOREA.—A statement received from Tokio on September 22 announced that fifteen hundred new cases of cholera have been discovered in Korea. This makes the total number of cases more than twenty thousand, of whom more than nine thousand have died.

THE BOSTON
Medical and Surgical Journal

Established in 1812

An independently owned Journal of Medicine and Surgery, published weekly under the direction of the Editors and an Advisory Committee, by the Boston Medical and Surgical Journal Society, Inc.

THURSDAY, OCTOBER 21, 1920

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An editor will be in the editorial office daily, except Sunday, from twelve to one p.m.

Papers for publication, and all other communications for the Editorial Department, should be addressed to the Editor, 126 Massachusetts Ave., Boston 17. Notices and other material for the editorial pages must be received not later than noon on the Saturday preceding the date of publication. Orders for reprints must be returned in writing to the printer with the galley proof of papers. The Journal will furnish free to the author, upon his written request, one hundred eight-page reprints without covers, or the equivalent in pages in the case of articles of greater length.

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Boston Medical and Surgical Journal

126 Massachusetts Ave., Cor. Boylston St., Boston 17, Massachusetts

MATERNITY AID.

The Journal asks its readers to consider most carefully the letter of Dr. Walter P. Bowers published in another column. He suggests a plan for legislation for maternity benefits which he has submitted to the special commission now considering this matter. The Journal has already expressed the opinion that some legislation will be enacted, and is confirmed in this belief by the fact that both political parties have endorsed in advance any program the commission may advocate. The public has a legitimate interest in this matter. It is a source of regret that the medical profession have not clearly defined opinions as to what should be done to better existing conditions.

Under these circumstances the truly conservative suggestions of Dr. Bowers are most welcome. His plan builds upon existing institutions, and proposes that these institutions be improved and enlarged. In the beginning it is proposed to start in a simple and economical manner and let experience show the lines of progress. Reduced to its simplest terms Dr. Bowers suggests that well conducted and adequate Lying-In Hospitals be aided by the State in suitable cases, provided pregnancy and infant welfare clinics are conducted in connection with the maternity clinics. Thus automatically the two factors are established which have done most to cut down maternal and infant mortality. It must follow that physicians will have better opportunities to concentrate their attention on these important matters and as time goes on improved hospital facilities will make obstetric practice more attractive and hence better conducted.

The Journal does not wish to forestall any recommendations of the special commission. They are studying most carefully conditions of obstetric practice and the reasons for the increasing maternal mortality. This report and their recommendations are looked for with great interest and with full expectation that they will present a plan which must commend itself to the medical profession as a whole. Less than four weeks remain before the legislature considers this matter.

The medical profession through the appointment of the President of the Massachusetts Medical Society as chairman of the commission, has been asked to point out what should be done. If we give no answer we must not complain of whatever plan is adopted. And furthermore, we must not expect to be consulted with much eagerness in the future on questions of medical importance. The matter demands the best thought of us all. The time is short but the opportunity is still open; the duty is pressing.

Worcester North District Medical Society.—The following extension course of lectures has been arranged by the Worcester North District Medical Society in coöperation with the Harvard Medical School:

Oct. 26. Dr. Lincoln Davis. "Acute Surgical Conditions of the Abdomen."

Nov. 2. Dr. Franklin W. White. "The Modern Examination of the Stomach." Illustrated with projection lantern slides.

Nov. 9. Dr. Frederick C. Irving. (*a*) "Pre-eclamptic Toxemia." (*b*) "Antepartum Hemorrhage." (*c*) "Difficult Labor."

POLIOMYELITIS IN VERMONT.

In view of the present incidence of poliomyelitis in Boston and Massachusetts, it is of interest to compare the experience of another New England state in regard to this disease. The subject is reviewed in a recent bulletin of the Vermont State Board of Health in an article, "Poliomyelitis in Vermont, 1918 and 1919," by Charles F. Dalton, M.D., and W. L. Aycock, M.D.

Poliomyelitis was first made reportable in Vermont in 1910, and the records of annual epidemics since that time show that communities in which there appeared a considerable number of cases in one year became comparatively immune for the next two or three years. Years in which there has been a high incidence have been succeeded either directly or gradually by minimum records. After the severe epidemic of 1914, for example, when 304 cases occurred, the incidence dropped in 1915 to 44 cases, subsequently increasing slightly to 64 cases in 1916 and then to a higher incidence of 171 cases in 1917. In 1918, however, only seven cases were discovered, followed in 1919 by 15 cases, with the prospect, if former precedents can be relied upon, of an increase in 1920. The report states that the seven cases of poliomyelitis listed in 1917 were well scattered, and, except for two cases in the same family, had no apparent connection one with another.

It was not possible to establish any infectious source. Only three of the cases were reported in the acute stage, the others being unattended or unrecognized and later discovered by means of resulting paralysis. No deaths occurred in 1918 from this disease.

In 1919, 15 cases of poliomyelitis were recognized in Vermont; seven of these, some of which were associated to some extent, occurred within a small area in the southern part of the state. Ten of the cases were males and five females, or 66.6 per cent. of the cases were males and 33.3 were females. The average percentage of males to females who have contracted the disease in Vermont during the last ten years has been 57.9 per cent. to 42.1 per cent. There has been a preponderance of males over females each year with the exception of 1918, when there were five females and two males affected, or 71.5 per cent. to 28.5 per cent. In 1919 the preponderance of males was the same as the preponderance of females over males in 1918. These figures represent the greatest variations which have occurred in Vermont at any time during the last ten years.

The greatest incidence in 1919 occurred among persons of four years and under and from ten to nineteen years of age. The average percentage of cases in different age groups for the last ten years has been 43.2 per cent. for those of four and under; 27.2 per cent. among those from ten to nineteen; 20.3 per cent. for ages between twenty and twenty-nine; and 5.1 per cent. among adults over twenty-nine years. Although the date of paralysis has not been ascertained in all of the 1919 cases, it is known that in each case it occurred before the fifth day of the disease. The usual complex combinations in muscle groups affected were observed. There was only one case of respiratory paralysis, and a considerable predominance of paralysis of the leg muscles. There were no deaths from poliomyelitis during 1919. The greatest incidence occurred in August and September. It is interesting to note that the 1919 cases were grouped to a great extent in a section of the state in which there has never been an outbreak of poliomyelitis, and that this section was contiguous to an area which had a number of cases of poliomyelitis in 1917.

DANGER TO AMERICA FROM EUROPEAN EPIDEMICS.

That America is in considerable danger at the present time from contagious diseases which might be brought here through the emigration of peasants and other refugees who have been exposed to maladies epidemic in Europe has been pointed out by Surgeon-General Cummings of the United States Public Health Service. There are seven million people trying to gain access to this country from those sections in Europe where typhus and yellow fever are epidemic. A large majority of these people are trying to come from Asia Minor and the Black Sea district of Russia through the ports of Danzig, Bremen, and Rotterdam; efforts are being made, therefore, by public health officials to reconcentrate them in Greek and Italian ports for transportation to the United States. In many Mediterranean ports bubonic plague, as well as typhus, is prevalent and as twenty cases have been reported recently in Paris, it is

apparent that the disease must have reached the city through Havre or other ports. Although we are prepared to expect such conditions in uncivilized and unsanitary countries, they are not to be tolerated in northern countries where public health supervision is available.

In order to protect the United States from being subjected to the danger of disease from foreign sources, the United States Public Health Service is taking whatever precautionary measures are possible. Medical officers have been stationed at Danzig and at Dutch and Belgian ports, as well as at the more important Greek ports, in order to inspect all vessels and enforce precautionary measures among the emigrants. Vessels from other infected ports are prevented from entering United States waters. Both plague and yellow fever are epidemic in Mexico also, as well as in Guatemala and Salvador.

The Public Health Service is represented at all quarantine stations in the United States, and public health agents board all incoming vessels in order to fumigate them and destroy rats. In its effort to safeguard the health of the people, the Public Health Service is maintaining a vigilant watch on all immigrants arriving in this country. It is of utmost importance that the people and the government realize the danger of America becoming a foothold for European plagues, and coöperate with the Public Health Service by reporting any suspicious cases so that prompt and efficient assistance can be rendered and every possible precaution taken.

THE OSLER INSTITUTE OF GENERAL PATHOLOGY AND PREVENTIVE MEDICINE.

As an expression of the world's indebtedness to Sir William Osler as a physician, a teacher, and an investigator, it has been proposed by a number of representative members of the University of Oxford and of the medical profession that there be established an Osler Institute of General Pathology and Preventive Medicine. Such an institution would be an appropriate memorial to Osler's life work; for although during the early part of his career his chief interest was in pathology, he later became an enthusiastic believer in the future of preventive medicine. A general committee and an executive committee have been formed to direct the raising of funds; upon the response to the appeal issued by the committees will depend to a considerable extent the ultimate nature of the memorial. A memorial of this sort, of practical and daily value to the advance of medical science, would have been appreciated by Osler, whose whole life was devoted to the progress of medicine, both by his contributions to it and by his efforts to promote, distribute, and organize it. Few physicians have attained the international esteem in which Sir William Osler is held in Canada, England, in the United States, and in other countries. It is fitting, therefore, that the institute erected in his memory should be of international interest and benefit, reflecting in its purpose and ideals, as would the proposed Osler Institute of General Pathology and Preventive Medicine, Osler's nobility of character, his breadth of sympathy, and his greatness of achievement.

MEDICAL NOTES.

American Electro-Therapeutic Association.—At the 30th annual meeting of the American Electro-Therapeutic Association, held at Atlantic City September 14-17, the following officers were elected to serve for the ensuing year: President, Dr. Byron Sprague Price, New York City; vice-presidents, Drs. V. C. Kinney, Wellsville, N. Y.; C. M. Sampson, St. Joseph, Mo.; Charles Collins, Washington, D. C.; D. A. Cater, East Orange, N. J.; W. T. Johnson, Philadelphia; trustees, Drs. F. B. Granger, F. H. Morse, both of Boston; W. M. Clark, Philadelphia; E. C. Titus, New York; William Martin, Atlantic City; Frederic deKraft, New York City; treasurer, Dr. J. W. Travell, New York City; secretary and registrar, Dr. A. Bern Hirsh, New York City.

Institute for the Control of Venereal Disease.—It has been announced that an Institute for the Control of Venereal Disease, under the auspices of the United States Public Health Service, will be held in Washington, D. C., beginning November 22 and continuing for two weeks. The faculty will be composed of approximately twenty-five lecturers and instructors, including Dr. John H. Stokes, Rochester, Minnesota; Dr. Hugh Young, Baltimore, Maryland; Dr. John A. Fordyce, New York City, and Dr. Edward L. Keyes, Jr., New York City.

YALE MEDICAL SCHOOL APPOINTMENTS.—Dr. Lane and Dr. Alfred G. Madler have been appointed clinical professors of dermatology in the Yale Medical School, to sueeeed Dr. Ralph A. McDonnell, who has resigned.

APPOINTMENT OF DR. CHARLES MACFIE CAMPBELL.—Dr. Charles MaeFie Campbell has resigned as assistant director of the Henry Phipps Psyehiatric Clinic, Johns Hopkins Hospital, to become professor of psyehiatry at the Harvard Medieal School and director of the Boston Psyehopathie Hospital. Dr. Campbell began his new work on October 1.

GRANT TO THE PENNSYLVANIA STATE COLLEGE.—The sum of five thousand dollars has been granted to the Pennsylvania State College by the Roekefeller Institute for Medical Research to be used in promoting the research in animal nutrition which has been eonducted for the past twenty years by the Institute of Animal Nutrition under the direetion of Dr. H. P. Armsby.

MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH.—Dr. Leonard G. Rowntree, professor of medicine in the medical school of the University of Minnesota, and Dr. Reginald Fitz, assoeiate in medicine of the Massachusetts General Hospital, have become members of the staff of the Mayo Foundation for Medical Education and Research, Rochester, Minnesota, for the purpose of developing further research in internal medicine.

NUTRITION INSTITUTES. — Representatives of twenty-five associations for child welfare in Rochester, New York, will be given an intensive eourse the first week in November, in preparation for work in nutrition clinics and classes. Neighboring communities will also send workers for training. A large number of children are now being weighed and measured in order to form classes of those who are seven per cent. underweight for their height. The undertaking is directly under the control of the Board of Education and is similar to that now in operation in Chicago, where twenty-three schools are already organized, and in Cleveland, which has established five school district centers. Dr. W. R. P. Emerson of Boston will have charge of the course, with the co-operation of various community representatives, including Prof. John R. Murlin of the University of Roehester.

In Newport, Rhode Island, Dr. Charles Easton, formerly of the Massachusetts General Hospital, and Dr. Keenan of the loeal health department, have charge of nutrition elinics which are showing excellent gains in weight.

Congress has recently appropriated $15,000 for nutrition work in Washington, where 20,000 children are to be examined under the direction of Dr. Benton, head of ehild welfare work for the District of Columbia. These physieians recently visited the Boston nutrition classes in which the nutrition workers seleeted to take eharge of them were trained.

The western representatives of Nutrition Clinics for Delicate Children—the Elizabeth McCormiek Memorial Fund—have arranged for Dr. Emerson to make monthly visits to Chicago, in order to give personal direetion to the clinics and classes of that city.

VENEREAL DISEASE STATISTICS.—A statistical table of venereal diseases reported to the State Boards of Health by physicians, clinicians, hospital superintendents and other sources show that during the month of June, 1920, 25,450 cases were reported, and that there were 12,149 new admissions to the clinics operating under the joint eontrol of the United States Public Health Serviee and the State Boards of Health. There were administered during the month 30,730 doses of arsphenamine.

ANTIMALARIAL MEASURES ON THE ISLAND OF CYPRUS.—The antimalarial measures which were begun in 1913 on the Island of Cyprus were continued successfully during 1919 and resulted in a further reduction in the disease for that year. The annual medical report states that malaria incidenee has deereased steadily from 10,035 eases treated in 1912, to 1,962 in 1919, and the spleen index has deelined from 17.2 per cent. in 1913 to 5.2 in 1919. The estimated population of the Island of Cyprus in the year 1919 was 311,108, as compared with 306,997 in 1918. In carrying out the antimalarial work, marshes and a fresh-water lake have been drained during the year, and aqueducts and drains have been constructed and repaired.

CHAULMOOGRA OIL IN THE TREATMENT OF LEPROSY.—An important and interesting arti-

cle on the treatment of leprosy, with especial reference to some new chaulmoogra oid derivatives, by Dr. J. T. McDonald, has been published in a recent Public Health Report. In view of recently reported results in cases treated with chaulmoogra oil, the following conclusions to this study are of especial interest:

1. The intramuscular injection of the ethyl esters of the fatty acids of chaulmoogra oil usually leads to a rapid improvement in the clinical symptoms of leprosy. In many cases the lesions disappear, except for scars and permanent injuries, and the leprosy bacillus can no longer be demonstrated.

2. When combined with iodine, the fatty acids of chaulmoogra oil and their esters give good results; but there is no adequate experimental proof that this addition of iodine causes any increase in the effectiveness of the materials used.

3. All of the available evidence obtained from the use of fractions of the fatty acids of chaulmoogra oil indicates that the therapeutic action is due to one or more of the fatty acids of the oil or to some as yet unidentified substance associated therewith. The various methods of fractionation heretofore employed have failed to demonstrate the active agent.

4. Although conclusive evidence is not at hand, it is probable that the oral administration of chaulmoogra oil derivatives is of minor importance compared with the injections.

5. In treating leprosy, it is important to make use of all auxiliary agencies to build up and maintain bodily vigor.

6. Hypodermic injections of the ethyl esters into leprous nodules are followed by marked swelling with ultimate recession of the lesions. This is a valuable auxiliary treatment for especially resistant lesions.

There has been received sufficient evidence to indicate that chaulmoogra oil contains one or more agents which exert a marked therapeutic action in many cases of leprosy, and although it has not yet been determined with finality whether or not the apparent cures are real and permanent, it is at least certain that we have in chaulmoogra oil a valuable agent at our disposal in the control of the disease.

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending October 9, 1920 the number of deaths reported was 172 against 171 last year, with a rate of 11.99* against 11.20 last year. There were 36 deaths under one year of age against 33 last year.

The number of cases of principal reportable diseases were: Diphtheria, 32; scarlet fever, 19; measles, 10; whooping cough, 8; typhoid fever, 2; tuberculosis, 67.

Included in the above were the following cases of non-residents: Diphtheria, 13; scarlet fever, 2; tuberculosis, 14.

Total deaths from these diseases were: Tuberculosis, 11.

Included in the above were the following cases of non-residents: Tuberculosis, 1.

Infantile paralysis cases, 11; deaths, 1.

Organization of a State Surgical Association.—A meeting was held in Worcester on September 22, for the organization of a State Surgical Association. The purpose of this organization is to bring into one democratic organization the surgeons of Massachusetts, so that by frequent meetings, clinics and full and frank interchange of views they may secure such intelligent unity and harmony in every phase of their labor as will elevate and make effective the opinions of the profession in all scientific, legislative, public health, material and social affairs, to the end that the profession may receive that respect and support within its own ranks and from the community to which its honorable history and great achievements entitle it. The movement has the endorsement of the American Medical Society.

The Boston City Hospital, Massachusetts General Hospital, Women's Free Hospital and Peter Bent Brigham Hospital have agreed to give a special surgical clinic of two days' duration November 10 and 11 for the benefit of the Association.

Appointment of Dr. John Mason Little.—Dr. John Mason Little of Boston has been appointed assistant chief surgeon of the Boston and Albany Railroad. This is a new medical office, recently established by the officials of the railroad. Dr. Little was graduated from the

* Based on the 1920 Federal Census.

Harvard Medical School in 1901. After serving in the Massachusetts General Hospital and studying for a year in Vienna, he served as an assistant to Dr. Samuel Mixter for four years. He then went to Labrador to devote a few months to medical and surgical work in Dr. Grenfell's Hospital at St. Anthony, but his work there extended over a period of more than ten years. About three years ago he returned to Boston to practise, and has served on the general staff of the Massachusetts General Hospital.

EXAMINATION OF CHILDREN FOR INDUSTRIES.—A warning has been issued to parents by the State Department of Labor and Industries calling attention to the provisions of the school attendance law, which requires that every child between the ages of 14 and 16 years must be kept in school unless a working certificate has been issued for the child. In order to obtain a certificate, the child must present to the superintendent of the school a certificate signed by a physician appointed by the school committee, stating that the child has been given a thoroughly physical examination by the physician and is in sufficiently good health and physically able to perform the work which he intends to do. An investigation of this matter has led to the discovery that in a great many cases certificates have been signed without any examination having been made or that the examination has been so superficial as to be valueless. The following statements referring to the duties of physicians in this regard have been issued:

"The issuing of health certificates to children entering industry should, in every community, be under the supervision of one physician designated for the purpose by the local school committee or the board of health. The reason for this is that it is only by placing the responsibility with a definite authority that uniform standards can be secured and maintained.

"It is the examining physician's duty to decide from the examination he makes whether the child is in sufficiently sound health to perform the work elected by him. The purpose of this requirement for health certificates is to safeguard the child entering industry, to shut out from industry children with such serious defects as to make their employment in occupation dangerous, and to protect children with minor defects from entering occupations or processes for which they are physically unsuited. A child with tubercular tendencies, for example, should not be certified for work in a cotton mill, nor one with a weak heart for work which would require lifting heavy weights, or running up and down stairs. A child with defective vision should not be permitted to engage in work involving eye strain.

"The object of the law is defeated unless the examination of the child is definitely related to the work he desires to enter. Examining physicians should acquaint themselves with the general nature of the occupations which children in their district enter."

BEQUESTS TO MEDICAL INSTITUTIONS.—By the provisions of the will of the late Henry H. Sprague of Boston, the sum of two thousand dollars has been bequeathed to the Boston City Hospital, of which Mr. Sprague was a trustee for thirty years, for the purchase of books or other articles for the comfort of the patients in the South Department. One thousand dollars has been left to the Boston Lying-In Hospital.

ANTERIOR POLIOMYELITIS IN BOSTON.—On the recommendation of the advisory council of the Health Department of Boston, an appropriation of ten thousand dollars has been made by the City Council to be used in combating the spread of infantile paralysis in this city. The disease has been more than usually prevalent in Boston and the surrounding communities during August; statistics show that there were five cases during the week ending August 7, against none the corresponding week of the three preceding years; thirteen in the week ending August 14, against two last year, and none in the two preceding years; and seven in the week ending August 21, compared with none last year, and one in each of the two preceding years. During the epidemic of 1916, the cases for the three weeks referred to were respectively nine, four, and eight. A plan has been outlined by Dr. Woodward, City Health Commissioner, whereby there shall be appointed three diagnostic experts, who shall be on call at all times to aid physicians; an epidemiologist, and clerical assistants. It is thought that the present outbreak of the disease may be expected to last for about three months.

The following announcement has been sent to physicians by the Health Department:

During the month of August 56 cases of anterior poliomyelitis, of which 15 were non-residents admitted to Boston hospitals, were reported to the Boston Health Department. While the number of cases does not at present appear to be increasing, the disease has been reported from all parts of the city and the possibility of anterior poliomyelitis should be kept in mind in all cases of illness presenting symptoms suggestive of the beginning of this disease.

Anterior poliomyelitis is a disease which by law is reportable to the local Health Department. Please report your cases promptly on the postal cards provided by this department.

No definite measures are known whereby the spread of anterior poliomyelitis can be prevented, but experience seems to justify the requirement of the Health Department that patients or persons presenting suspicious symptoms be isolated in the same manner as a case of scarlet fever and that all secretions or discharges from the patient, and his eating and drinking utensils, be carefully sterilized.

In view of the great importance of an early and correct diagnosis in this disease the Boston Health Department is now prepared to furnish local physicians with expert diagnostic assistance in any doubtful or suspicious case. Should you desire such assistance telephone Fort Hill 5100, Health Department, Medical Division, between the hours of 9 A.M. and 5 P.M. daily and Saturday until 12 M. At all other times call Main 3887.

The Boston Medical Library.—The forty-fourth annual report of the Boston Medical Library, for the year 1919, shows that the library has increased in size, importance, and general usefulness. During the year the Library was fortunate enough to obtain nearly complete sets of most of the foreign periodicals which were held back by the war. In view of the decreased number of medical books published, the policy was adopted of purchasing at auction and from second-hand catalogues some of the older books and journals which, under other circumstances, would not have been purchased until the supply of ordinary and more recent books had been secured. The Library Building is overflowing with books from basement to attic and is in great need of a new stack building. The feasibility of building wooden stacks in the rear upper hall of the building was considered, but it was finally decided to utilize instead a room and a closet in the basement, thus providing space for about 6,000 volumes. A collection of 8,000 volumes, for the most part the property of the Essex South District Medical Society, were received by the Library from the Essex Institute of Salem. A total number of 671 current periodicals were received during the year. Most of the German journals are now being received, although there are undoubtedly some whose publication has been suspended. A decrease in the number of French journals received is due in large part to the discontinuance of journals from Belginm and north-eastern France. The total number of volumes in the possession of the Library has been increased from 33,000 in 1901 to over 100,000 at the present time, exclusive of the 10,011 volumes in the duplicate library. There were bound during the year over two thousand periodicals, books, and monographs. The total attendance during 1919 was 7,261, or an average of over twenty-four persons a day. There were elected thirteen Fellows and thirty-eight Associates; the total membership is now eight hundred and fifteen, including Life Members, Fellows, and Associates. The report contains a list of the donations made to the Boston Medical Library in 1919.

NEW ENGLAND NOTES.

Bequest of $20,000 to the Maine General Hospital.—The will of the late Mary J. E. Clapp of Portland, Maine, included a bequest of twenty thousand dollars to the Maine General Hospital.

Correspondence.

MATERNITY BENEFITS.

Boston, Mass., Oct. 7, 1920.

Mr. Editor:—

In recent years various legislative activities have dealt with matters of grave importance to the medical profession. The history of the Workmen's Compensation Act is fresh in our minds. The apathy of the profession led to the possibilities for harm. This movement, which was not the expression of ripened judgment in its early stages, gained momentum, and, like any flood, was difficult to manage after it had gotten well under way. A little effort early would have prevented great waste of effort and the expenditure of some money.

Another important matter is up for consideration, which relates to maternity benefits and infant welfare. Bills were presented last year, one of which provided for financial benefits for pregnant women. Under this bill there was the possibility of the expenditure of millions of dollars and the relation to and responsibilities of physicians under this scheme seemed objectionable.

It is undoubtedly true that the state has a responsibility. Recent editorials in the Boston Medical and Surgical Journal have brought to public attention the abnormal mortality of childbirth.

One candidate for the Presidency of the United States has emphasized the dangers of maternity. He states that among 16 important countries, 13 show a lower death rate for mothers than the United States, and six a lower death rate for very young children.

The President of The Massachusetts Medical Society, who is Chairman of the Commission to study the question of care of pregnant women and infant welfare, reports that the statistics of Massachusetts show that the mortality of parturient women and of infants does not compare favorably with many other states, and that further, physicians have shown a lack of interest in the subject and of coöperation with the Commission, which is a reflection on the loyalty or intelligence of the profession, or both.

There is no available knowledge of the morbidity of child-bearing women except so far as the mortality may be an index. If surgeons would testify to the operations made necessary by the parturition itself, or inadequate medical service, and if practitioners were obliged to report sepsis or other diseases incident to pregnancy, childbirth and morbid conditions in the newborn child, these questions could be rationally dealt with. If preventive medicine can be employed to reduce the mortality and morbidity of pregnancy, it is just as logical for the state to interest itself in these matters as it is in cases of scarlet fever. One may reasonably argue that the life and health of a child-bearing woman is of inestimable value to the state. Senator Harding says that the Government is spending twice as much for suppression of hog cholera as for the welfare of the child. If we were cannibals, perhaps the latter matter would have received more attention.

I have had the honor of presenting to Dr. Worcester's Commission tentative suggestions for the skeleton of a Bill, and reproduce them here:

SUGGESTIONS FOR A BILL RELATING TO PREGNANCY AND INFANT CLINICS.

Health measure rather than charity.

Division of the Department of Public Health under the name of Maternity and Infant Welfare, or some other suitable designation.

Either as an entity or sub-division under Hygiene.

There should be appointed in charge of or under the Division of Hygiene, one or more experts in obstetrics.

This division should organize a staff of inspectors who shall investigate the obstetric service in hospitals and in private practice throughout the state. Where it may be found that the work done in any given institution is commendable, both in quality and readiness to meet local conditions, such institution should be classified as approved. Approved hospitals should be required to establish adequate obstetric facilities for all possible cases and also service for pregnant women and infant care, *i. e.*, pregnancy and infant clinics where cases may be studied and prescribed for at rates to be approved by the Director of the Division. Whenever it may be found that a given case cannot pay the approved charges, upon report to the Director, and upon his approval, the state shall pay to the institution the whole or part of the cost, as may be found necessary.

Agreement by the hospital to develop such service as may be outlined by the Director, shall be a prerequisite to license as a Lying-in Hospital.

Whenever it may be found that a community does not or will not provide suitable provisions for pregnancy and infant clinics, the Division shall organize a dispensary or even provide an obstetric hospital. For example the North End, Boston.

In scattered communities, groups of towns could be made into a district and officials appointed by the Director should go at stated intervals to carry out the purposes outlined.

Experts should be employed who shall act as advisors to local hospitals and to physicians. Whenever it may be found that pregnant women are not normal, the cases should be placed under proper supervision and environment.

The Department of Public Health should be given authority to establish rules requiring physicians to report all essential facts relating to mortality and morbidity of pregnant women and infants. Every effort should be made to develop local interest in local organizations, similar to the activities of anti-tuberculosis societies, working in cooperation with health authorities.

The morbidity of pregnancy and infancy should be as fully and promptly reported as communicable diseases, or ophthalmia, so that the responsibility of the medical profession could be studied.

This plan would in time eliminate the midwife and the poorly qualified physician from obstetric work.

Midwives now add to the mortality and morbidity of childbirth. Many avoidable injuries to women may result from inefficient medical service.

In explanation permit me to reiterate and urge that this matter should not be dealt with as a charity except in an incidental way, neither should there be established a great top-heavy organization in the beginning. Rather a division under the Department of Public Health for careful study and gradual development as the ascertained facts warrant.

This project can only be logically developed under the guidance and coöperation of the medical profession. Every physician should feel some measure of responsibility and this matter should be discussed in medical societies.

Past history shows that doctors are themselves to blame for some faulty legislation relating to health measures. Sins of omission are sometimes as disastrous as blunders of commission. We have intelligent and constructive minds in the profession but if they are not put to work this proposed scheme and kindred efforts may be driven into unproductive channels or even become political playthings.

When Dr. Worcester reported, October 6, to the Council of the Massachusetts Medical Society the lack of coöperation in this vitally important matter now under his direction, I felt disturbed, and this communication is forwarded with the hope that some interest may be aroused and the profession led to take concerted action. Discussions are necessary to develop the wisest plan.

WALTER P. BOWERS.

SOCIETY NOTICE.

SUFFOLK DISTRICT MEDICAL SOCIETY.—The Censors of the Suffolk District Medical Society will meet for the examination of candidates at the Medical Library, 8 The Fenway, Thursday, November 4, 1920, at four o'clock.

Candidates should make personal application to the Secretary and present their medical diploma at least one week before the examination.

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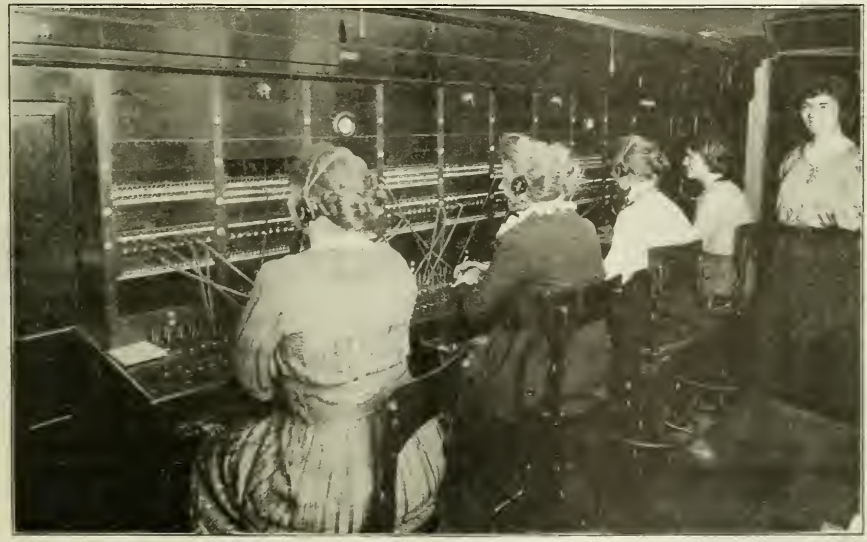

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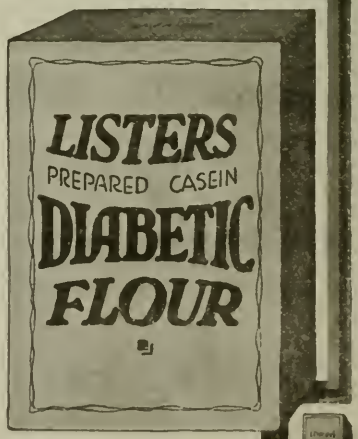

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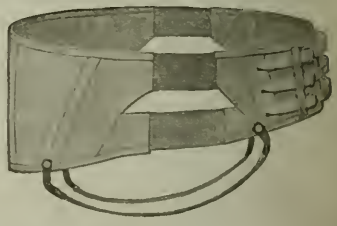

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